

Coordinated Efforts Provide Enabling Knowledge to Advance SSL Technology

To accelerate solid-state lighting (SSL) technology developments, the U.S. Department of Energy leverages the strengths and capabilities of the Office of Science and the Office of Energy Efficiency and Renewable Energy (EERE).

- The Basic Energy Sciences (BES) program within the Office of Science conducts basic research to advance fundamental understanding of materials behavior, with the goal of impacting future directions in applied research and technology development.
- EERE's SSL portfolio guides technology advances from laboratory to marketplace with a comprehensive approach that includes Core Technology Research, Product Development, Commercialization Support, and Standards Development. Core Technology Research focuses on applied research for technology development, with the goal of meeting performance and cost targets.

Through coordination and collaboration, these DOE research programs are working together to provide the scientific foundation for new forms of lighting. In February 2006, BES held a Contractors' Meeting in conjunction with the DOE SSL Program Planning Workshop. BES researchers shared project updates on BES-supported fundamental research related to SSL. The workshop also included presentations on all DOE-funded SSL projects, providing a snapshot of DOE's SSL R&D portfolio and opportunities for further discussion and potential partnerships. In May 2006, BES hosted a workshop to focus specifically on identifying basic research needs and challenges that impact on energy-efficient SSL. The research directions identified at this workshop provided additional guidance for DOE planning.

DOE SSL RESEARCH

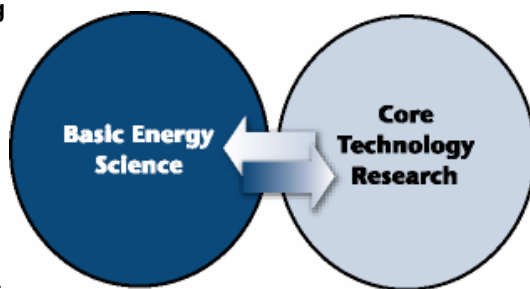
Basic Research to Advance Fundamental Understanding

Focus

Basic scientific questions underlying materials behavior

Deliverables

Knowledge of physical, chemical, and materials sciences that enables development of new synthesis techniques and novel materials
Characterization capabilities to support these investigations



Applied Research for Technology Development

Focus

Technical targets for performance and cost

Deliverables

Materials and components for SSL technologies that meet efficiency, performance, and cost targets



U.S. Department of Energy

Energy Efficiency and Renewable Energy

Bringing you a prosperous future where energy is clean, abundant, reliable, and affordable

Basic Research Advances Fundamental Understanding

BES projects focus on basic scientific questions that underlie DOE mission needs. These projects target principles of physics, chemistry, and the materials sciences, including knowledge of electronic and optical processes that enable development of new synthesis techniques and novel materials. BES encourages the development of results from its experimental and theoretical research programs and user facilities that will impact future directions in applied research and technology development. Project results often have multiple applications, including SSL.

Core Technology Research Focuses on Technical Targets

EERE's SSL portfolio draws on its long-term relationships with the SSL industry and research community, using a series of ongoing, interactive workshops to refine an extensive R&D agenda. This approach ensures that DOE funds the appropriate research topics that will improve efficiency and move SSL into the market. Input from these workshops helps to shape research priorities and the development of solicitations. Core Technology Research projects focus on applied research for technology development, with particular emphasis on improving the performance and durability of materials and components, as well as cost reduction.

DOE Drives Emphasis on Energy Efficiency

DOE's support of SSL is essential to ensure the development of *energy-efficient* SSL technology—an emphasis that, without DOE leadership, might be lost on the path to commercialization. The Department's involvement in SSL technology development pushes industry to higher levels of efficiency than they might otherwise achieve.

The Department's support also maintains our nation's technology leadership. While projected energy savings are significant, high-efficiency white-light sources represent a somewhat risky investment that industry is unlikely to fund exclusively. If our nation is to maintain its leadership position in SSL technology development, the U.S. must meet or exceed other countries' commitment to SSL initiatives. The results from DOE's collaborative projects will ultimately deliver substantial energy savings and position U.S. companies as global leaders in new lighting products, systems, and service markets.